

Multi-decadal variations of atmospheric aerosols and their effects on surface radiation trends

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We present an investigation on multi-decadal changes of atmospheric aerosols and their effects on surface radiation using a global chemistry transport model along with the near-term to long-term data records. We focus on a 28-year time period of satellite era from 1980 to 2007, during which a suite of aerosol data from satellite observations, ground-based measurements, and intensive field experiments have become available. We analyze the long-term global and regional aerosol trends and their relationship to the changes of aerosol and precursor emissions and assess the role aerosols play in the multi-decadal change of solar radiation reaching the surface (known as “dimming” or “brightening”) at different regions of the world.